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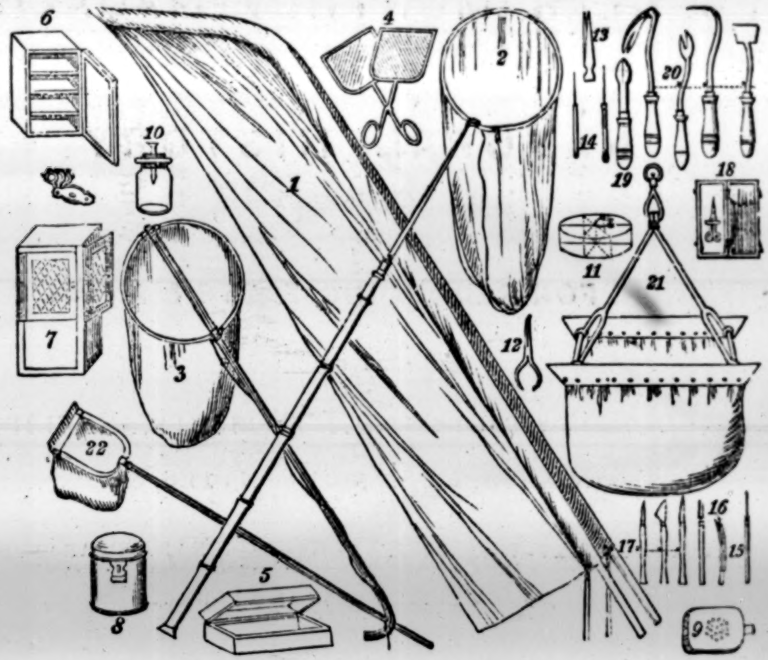

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BRITISH MUSEUM

Rev. Hamlet Clark.—Petropolis, February 18, 1857. — When my friend Mr. Gray and myself were making arrangements in England for an entomological visit to the province of Rio Janeiro, we experienced difficulty in obtaining information with regard to our proposed collecting-ground: it is true several works of travels in the Brazils have been published; one or two of them valuable, but none of them, except that of Spix and Martius, so far as I know, refer to Entomology: a modern work on the Entomology of Brazil is still a desideratum: in the absence, however, of more extended details and larger experience, perhaps a few notes and memoranda as to our localities, and the degree of our success may, if you can find space for them, be of service to future entomologists visiting this beautiful country.

We arrived in Rio early in December, being the commencement of the rainy as well as hot season; this period of the year was purposely chosen by us, as being, by all accounts, most favourable to insect life. We have now been ten weeks examining the Entomology of different localities in the province, and are able to form some opinion with regard to the climate and insect productions of the country: and first, let me say a few words as to its apparent salubrity. When in England we heard much of the ravages of yellow fever, and since we have been here this fearful disease has been more prevalent than during any previous season since that of its first appearance: its ravages, however, are confined to the unhealthy parts of the city, and especially perhaps to the shipping: it is on this account real cause for anxiety to residents in Rio, and hence fresh comers should at once, for a time, leave the lowlands near the shores of the bay, where little can be done entomologically; but to persons residing in the country or in the Organ Mountains there is as little cause for alarm as if they were in England. In all other respects the country still deserves the character it had before the introduction of yellow fever,—that of being one of the most healthy climates in the world. Let the traveller use only ordinary common sense, let him not expose himself unnecessarily to the rays of the sun, be careful to avoid excessive fatigue, and abstain from ardent spirits, then he will, humanly speaking, enjoy as vigorous health here as he has done at any portion of his life.

The following are localities at present visited by us, which deserve notice as entomological stations:—the Corcovardo Mountain, Pijuca, Constancia, Presidencia and Paraihiba: the two first are immediately above Rio, Constancia and Presidencia, in the Organ Mountains, and Paraihiba on the river of that name. An hour's walk from Botofogo, a suburb of Rio, where there are excellent hotels, is sufficient to reach the foot of Corcovardo, a well-known mountain, some 2,200 feet high; its collecting ground consists of a broad walk at the side of the famous aqueduct, three miles long, which runs for a considerable portion of its extent through virgin forest. Coleoptera are captured here, as elsewhere, by beating bushes, or when flying by means of an ordinary ring-net, although several new species each day were the result of our collecting here, but yet the locality was not so interesting as others, inasmuch as, from its propinquity to the city, it has been more carefully examined, and the species taken better known: on every day that we visited it we met collectors, principally blacks, employed by dealers in Rio; these blacks, without any superfluous clothing, carried in one hand a ring gauze-net on a thin bamboo pole 20 or 30 feet long, in the other a strip of some soft wood, stuck over with rude pins; this was all their apparatus: when they discovered any "bicho," either Lepidopterous or Coleopterous, above the ordinary size, or brilliant in colours, they gave chase, and if successful skewered their capture to their slip of wood, or to the outside of their cap. Many of such collectors we met, but not a single entomologist: Entomology, as a Science, is hardly known; with the one exception of Mr. Fry, whose splendid collections are still spoken of by every one here who knows what Entomology means, we have heard of no one who, either himself or by others, is seeking in any degree to become acquainted with the Fauna of the country. Notwithstanding, however, the number of collectors who are to be met with along the aqueduct, this locality well deserves the careful attention of the entomologist; granted that the larger species are known, and in European cabinets, there remain countless minute species disregarded utterly by those whose only object is to make up show-cases for the drawing-room, many of which doubtless will prove altogether new to Science.

Tijuca is a scattered hamlet, situated at a height of about 1000 feet, on a spur of the Corcovardo range, facing the sea, at a distance of ten or twelve miles from Rio: as an entomological locality it disappointed us: the hills surrounding it are generally cleared of forest, and converted into coffee plantations; owing either to this cause, or possibly to its contiguity to the sea, insects of all orders are scarce, or, in truth, for the most part entirely absent. The labour of several days here failed in securing as many species as could have been collected in the same time in any district in England. There is, however, one locality, within an hour's walk of Mr. Bennett's hotel at Tijuca, which is a decided exception: a road from Tijuca to the Botanical Gardens near Rio passes through coffee plantations for three miles up to the head of the valley, and then descends through virgin forest towards the sea-coast to the gardens. The part of this road that runs through the forest is so full of insect-life, that of itself it will well repay a week's visit to Tijuca; and this suggests one rule, which, so far as our experience goes, universally obtains: roads through, or the open sides of, virgin forest are *always* good collecting-ground: cleared country, milho or coffee plantations, even the second growth of timber, are seldom profitable, often absolutely barren; we have found everywhere that this distinction holds good. In England fine green luxuriant bushes by the road-side, coppices of wood fifteen or twenty years old, are excellent localities; here such contain next to nothing, compared with what may be found in virgin forests, places where the original growth has never been touched by man.

It is, however, in the Organ Mountains, richest in vegetation, most lovely in scenery, most healthy in climate, that we have found the best stations for the entomologist: such stations may of course be multiplied indefinitely; I notice two, both most excellent, accessible, and, so far as we can learn, both up to this time almost unexplored: Constancia is an excellent English boarding-house, kept by Mr. Heath, in the heart of the Organ Mountains, two days' journey from the city in a northerly direction; and Presidencia as comfortable a home for the English traveller, kept by Mr. Land, thirteen leagues from the city in a north-west direction (three miles from the German colony Petropolis, where the Emperor has his summer palace); both these, at altitudes of about 3000 feet, are in the midst of primeval forest, and would require for their examination months instead of days: I notice these two, not to the exclusion of other equally profitable localities, but because I know how much remains still to be discovered in each, and at the same time that the traveller will in them be sure to meet with English comforts and an English welcome.

Paraihiba is a city three days' journey from Rio, on the Minas road: it is healthy, although its situation is low and the heat intense. The immediate neighbourhood is covered with large coffee and also rice plantations, and consequently an entomological desert. At the time of our visit the fine river was swollen with the recent rains, but doubtless its banks, during the dry season, would well repay research. There are two tolerable hotels; the Hotel Universal, kept by a respectable Englishwoman is the best, but of course with only Brazilian accommodation; and several days might profitably be spent here in making excursions in different directions into the country on either side of the river.

Although every locality seems—as is to be expected—to have its peculiar character of insects, yet generally, through our entire excursion during this, the rainy season, we have found some orders everywhere abundant—some strangely scarce. Diurnal Lepidoptera abound, and are indescribably beautiful: it has been hard indeed to devote one's exclusive attention to any other group, when these exquisite insects are flitting around in the not more brilliant sunshine. I hardly know how far the Papilionidæ of the Organ Mountains have already received attention, but I am sure that if some of our English Lepidopterists could have seen them, in sunshine, in shade,—in masses of tens and twenties by the margins of forest streams,—they could not have been satisfied with simple admiration: words are wanting to convey any impression of their fresh beauty. Moths, especially minute species, are common by beating, and during the short twilight of evening: a little experience that we have had of sugaring by night proved that it was as effectual here as in England. Hemiptera are by no means abundant; Diptera appear to be almost confined to those abominations, sand-flies, musquitos and "Borrachudos," a very insignificant looking atom, which swarms at Tijuca and elsewhere, but which, by its bite, raises painful inflammations on the face and backs of hands. Hymenoptera are decidedly rare: of bees, although we have been at pains to capture all that we have met with, I do not believe that a dozen species can be found in our united collections: this is perhaps to be attributed to the unprecedented amount of rain that has lately fallen. The ants are very numerous and most interesting: some species construct covered galleries among the branches of trees; others burrow, *for miles*, six or ten feet below the surface of the ground; some are carnivorous, and seem to live principally on insects; others are vegetarians; one species in this neighbourhood is welcomed as a friend to the housekeeper, for when it marches through a house not a single cockroach or spider is left behind it alive; at Constancia and other localities there is a species which, in a single night, will strip a large tree of every leaf. In the forests on the Corcovardo range, we heard of—but could not see—an ant which constructs its nest above ground five or eight feet high; the sides of these nests are constructed of clay, worked up by mastication, so that, after a few years, they obtain the consistency of porous stone: in this state they have a commercial value; they are cut up into slabs or blocks, and used for the purpose of lining ovens.

HAMLET CLARK.

Petropolis, Organ Mountains,
Province of Rio Janeiro, February 18, 1857.

Reason and Instinct. By the Rev. J. C. ATKINSON, M.A.

PART THE SECOND.

WE will now suppose it conceded that the animals in the instances before cited or alluded to are possessed of all we contend for, but the objection raised that the individuals particularized, in each several species to which those animals belonged, are few—are probably the exceptions among their fellows of the said species; and that, moreover, the different species particularized are so few that they, too, could by no means be looked upon as establishing a law for the whole brute creation,—no, not even if every individual in each distinct species could be shown to be possessed of the full intellectual development and capacity we seem to claim for them:—in what position shall we be then? I think that our argument, notwithstanding such objection, will remain quite untouched. I think one part of the objection is much the same as asserting, and on the somewhat marvellous assumption that Newton's intellectual development was an exception among Anglo-Saxon intellects, that therefore the Anglo-Saxon race generally was not possessed of high intellectual capacity or capable of high intellectual exertion; and the other part seems to me to amount to about as much as would the opinion of a shrewd, intelligent, but uneducated and ill-informed man, who, never having before gone to the distance of twenty miles from his home in the Yorkshire Moors, and whose mind being a mere *tabula rasa* as to everything but the petty interests and experiences of his narrow home-valley, was all at once, by the use of some such improvement upon railways and steamships as Prince Housseyn's carpet, set down for a year or two among Diggers, Bushmen and Australian natives; the opinion, of course, that mankind, out of Yorkshire, were anything but a "canny" lot; that they had no capacity, no cleverness, no sense; that they were, indeed, in these respects, a long way behind the colley-dogs he had left behind in his native dale; an opinion about as reasonable—though to him, no doubt, appearing equally well founded, because equally the result of his own observation—as his very firm belief that the stars of heaven could not exceed 1,500 or 2,000 at the utmost, or that there was nothing whatever at the bottom of the stable-pail, out of which he had just taken the lock of hay he had dropped into it the preceding day, but a little water not entirely clean. Nothing can be more presumptuous, more rash, or more dangerous intellectually—perhaps even morally and religiously—than to deny the existence of things for no better reason than that we do not know that they exist. It bars the way to all inquiry, and leaves the mind in a state of stagnation, the prey of dull ignorance and growing indifference to progress and improvement. In all tentative learning, in every endeavour after synthetical knowledge, it is the business of the inquirer to record observation after observation, to use every new fact as a stepping-stone to another newer, and to proceed steadily and surely, no matter how slowly, from induction to induction. What we know about that essence or innate quality of the brute creation which is not bodily, is that it adapts its brute possessor, in a mysterious and wonderful manner, to perform certain functions, the performance of which we have learned, instinctively perhaps, to connect with our abstract idea of the particular animal in question. We know further that this essence or quality is found in every individual of every tribe of living creatures; in some, it may be, almost imperceptibly; in others, with a strange intensity and vivacity. But we do not know, we have not so much as the merest approach to reasons on which to found even an inference, that there is not a connexion, a necessary and self-existent connexion, between this essence or quality which we label Instinct and that higher essence or quality which we designate Reason, and the sole possession of which we, rather usurpingly it may chance, arrogate to ourselves alone out of the entire animal family. No doubt we have a labyrinth, by no means without its measure of perplexity and difficulty, to thread our way through the moment we commence the inquiry involved in what is here suggested—the inquiry, *i. e.* whether there truly is such a connexion,—but perhaps, after all, not so very much more intricate than if we limit the inquiry to the human species only. The intellectual difference between man and man in the same highly-civilized, education-pervaded, intellectually-famed community is quite as great, as startling, as incomprehensible, as between the most intelligent and sagacious of any given brute family, the dog, *e. g.*, and that other brute which shows little but mental hebetude, dulness, apathy, immobility. Nor is the immeasurable space between the poor Earthman or Digger and the cultivated, educated Englishman or Frenchman so easily bridged over as that which exists between the kangaroo* or the booby, and the elephant, the dog or the fox. And yet we can no more, on the one hand, maintain that the whole human race is not, at least, potentially, gifted with reason in its highest sense, than we can, on the other, assert that instinct is not perpetually and powerfully at work in every human being; albeit, in the one direction, little apparent by the side of intellectual lustre, in the other dividing, or, as but too often, even predominating in the empire of the mind. We know that instinct and reason do co-exist in the human being; that the loftiest intellect does not exclude the merest instincts; but we do not know that the co-existence between instinct, wherever met with, and reason is not necessary and inevitable.

For my own part, I incline to the belief that where there is apparent instinct, there is or may be also, in however small a degree, a reasoning power, whether latent or brought out and developed. I see no reason in the nature of things why it should not be so; and I see further that every observation on the habits and manners and actions of animals—few as those observations are, comparatively with what they might be, and with the vast number of living creatures, and few indeed as contrasted with the requirements of the merest empirical knowledge, far more of exact science or accurate discrimination—tends, in its measure and degree, to set up and establish such a theory on a sound and sufficiently broad basis. And in this connexion I think the following considerations (adverted to but postponed in the earlier part of our inquiry) are important and well worth attentive pondering.

The "mental principle" or "mind" either is or is not "of the same essence;" "essentially of the same nature" † in animals not human as in human beings. In what way, and by the use of what arguments, the negative is to be maintained, and, still more, made good, I must say, I do not see. A simple denial, however positive and dogmatical, of the affirmative position cannot but be nonsensically insufficient. No earnest, moderately candid inquirer could for a moment think of proposing that method of solving the question, any more than be satisfied with it if proposed by another. But all the phenomena observed make for the affirmative. Every action performed by an animal, evincing the presence of reasoning faculties in the animal's mind and the exercise of those faculties, affords a presumption, as it seems to me, not simply that there must be reasoning faculties in that animal, but that those faculties must be, in their essence or nature, strongly resembling, if not identical with, those reasoning faculties we are so well acquainted with in ourselves. They work on the same motives and by the same machinery, so far as we can trace their influence or their operation; and we have no more real or valid reason, *a priori*, to dispute that the origin of the motive power is the same in either case, than we have to question whether the agency which propels the steam-ship, drives the intricate machinery of the great factory, urges on the locomotive in its headlong rush, or puts in motion the mechanism which wields the ponderous Nasmyth hammer, is one and the same in each case. But more than this; physiological researches, so far as they have been already carried on, have shown that, in whatever way and degree the brain of man is connected with his intellectual organization, development or capacity, analogous observations on the brains of animals tend to the establishment of similar theories as regards them. "It being admitted that the brain is the material organ in connexion with the mental principle, and it being also admitted that there is in the different species of animals, on the one hand, a great difference as to the extent of their moral and intellectual faculties, and, on the other hand, a not less remarkable difference in the size and formation of the brain; so we cannot well avoid the conclusion that these two orders of facts are, in a greater or less degree, connected with each other. I do not mean to infer from this connexion that the mind is always the same, and that the greater or less development of it depends altogether on the greater or less perfection of the material organ. It may well be supposed that the original difference is in the mind itself, and that the Creator has so ordered it that the brain, in the different species of animals, should be such as will meet the peculiar requirements of the peculiar mind with which it is associated,—a view of the subject, which, if I am not misinformed, derives no small support from the researches of modern physiologists." ('Psychol. Researches,' p. 170.) Again; "Is it possible, from any experience that we have of the habits and character of a particular tribe of animals, to predicate what kind of brain we should find them to have on dissection; or, from our observations on the latter, to form an opinion as to their moral and intellectual capacities? To a limited extent, this knowledge is within our reach. If two brains were placed before me, in one of which the cerebral hemispheres were largely developed, while, in the other, they were very little developed or altogether absent, I should at once pronounce the former to indicate the existence of a much greater intelligence than the latter." (Id. p. 172.) Now I do not adduce these remarks and reasonings, in any sense, as proving or tending to prove that because there is a striking analogy between the connexion of the brain and the intellect in man, and that between the brain and "the mind" or "moral and intellectual capacities" in the brute, that therefore this analogy establishes the identity, the oneness, of the intellectual essence of the brute and of man; but simply as considerations tending to the support of such a theory. The arguments by which it is supported are of another description, and may be thus stated: whatever proofs may be alleged that brutes possess something beyond their mere visible, material bodies, are so far proofs that the resemblance and analogy, which, to so great a degree, exists between them and mankind, as to the physical structure of each, and the composition and functions of their several parts, not only may but must extend further yet. If sufficient or reasonable ground can be shown for believing that the "something beyond" which they possess is an immaterial principle, or, in other words, a soul or spirit, by the same process, and to the same extent, reason is shown for believing that the resemblance or analogy increases so far as to extend to—at the lowest statement—intellectual essence as well as physical structure:—so to betoken identity of immaterial endowment (however different in degree), unless it can, at the same time, be shown that there are various kinds of immaterial essence, or at least probable reasons for believing so. Now this process is carried out by Dr. Butler in Chapter I. of his 'Analogy of Religion,' and there would be but little wisdom in any attempt of ours to substitute another in place of his demonstration; but as there is reason to fear his reasonings are too long to be extracted entire, I will endeavour to give an analysis of his argument, and append to it, in his own words, the conclusion at which he arrives, so far as concerns the immaterial principle in the brute creation. He begins by stating that prior to any proofs, natural or moral, of a future life (of mankind, of course) there is no distinct ground or reason, either from the reason of the thing or from the analogy of nature, for apprehending that we (*i. e.* our living powers) must be destroyed by death. For, in the first place, we do not know at all on what the existence of our living powers depends; and this shows further there can no probability be collected, from the reason of the thing, that death will be their destruction; because their existence may depend upon somewhat in no degree affected by death. And, in the second place, we cannot find anything in the analogy of nature to afford us ever so slight a presumption that animals can lose their living powers—much less that they lose them by death. Death merely removes them from our view, and destroys the sensible proof which we had before their death of their being possessed of living powers. Moreover, the fact that they possessed these powers up to the very period to which we have faculties capable of tracing them, is itself a probability of their retaining them beyond it, especially when we take into consideration the very great and astonishing changes all living creatures actually pass through while yet living.

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* Referred to by Brodie as "having a very low degree of intelligence."

† See Psych. Enquiries, pp. 167, 169.

Further, there is no proof that our organized bodies, the portions of us actually subject to death, are really ourselves, or a part of ourselves, as living agents or beings; and there are presumptions to the contrary, deduced from (1) metaphysical considerations and (2) experimental observations.

1. The living agent cannot be pronounced or believed to be destructible by death, except it can be proved to be compounded and therefore discerptible; which it cannot be, as the perceptive power, or power of consciousness, must be indivisible, and therefore also the conscious being in which it resides, or living agents; whence our bodies are no more the living beings ourselves than any other matter.

2. Living agents may lose limbs, organs of sense, even the greatest part of their bodies, and yet remain the same living agents: even had the loss happened in their infancy, when their bodies were so small, still would they have been the same living agents. They may and do undergo a ceaseless change and loss of, or in, their bodies, from natural wear and tear, but their identity as living agents is not affected: and hence we are compelled to distinguish between the living beings ourselves and our material bodies, since these may be alienated and actually are in a daily course of succession and changing their owners; whilst we are assured each living agent remains one and the same permanent being.

Whence it may be observed, I. That we have no reason to think death will be the dissolution of the living being, because we cannot by experience determine that it is larger in bulk than the solid elementary particles of matter, indissoluble by any natural power, into which our bodies are resolved after death.

II. That from our being unaffected by loss and change in those systems of matter, our bodies, which proves they are not ourselves, we have no ground for thinking any other systems of matter, internal *e.g.*, to be ourselves; and therefore have no reason to think that what befals them at death will be the destruction of the living agents. We have passed undestroyed through many and great revolutions of the matter appropriated to us: the inference, therefore, is rather that that great revolution which we call Death will not be fatal to the living agents ourselves.

III. That if we consider our bodies as made up of organs and instruments of perception and motion, we shall be brought to the same conclusion. We have no reason to think our organs of sense,—the eye or ear, for instance,—in themselves percipients, but only instruments of our receiving appropriate ideas from external objects, and that in much the same sort of sense as telescopes or acoustic tubes, which are no part of the body at all: an impression confirmed by instances of persons losing some of their organs of sense, the living beings themselves, their former occupants, remaining unimpaired by the loss. It is also confirmed by the experience of dreams. And as regards our power of moving or directing motion by will and choice, it remains unlessened by the loss of a limb or of all our limbs; and there is no appearance of our limbs being endued with a power of moving or directing themselves.

"Upon the whole, then, our organs of sense and our limbs are certainly instruments which the living persons ourselves make use of to perceive and move with; there is not any probability that they are any more; nor consequently that we have any other kind of relation to them than what we may have to any other foreign matter formed into instruments of perception and motion, suppose into a microscope or a staff (I say any other kind of relation, for I am not speaking of the degree of it); nor consequently is there any probability that the alienation or dissolution of these instruments is the destruction of the perceiving and moving agent.

"And thus our finding that the dissolution of matter in which living beings were most nearly interested is not their dissolution, and that the destruction of several of the organs and instruments of perception and of motion belonging to them is not their destruction, shows demonstratively that there is no ground to think that the dissolution of any other matter, or destruction of any other organs and instruments, will be the dissolution or destruction of living agents, from the like kind of relation. And we have no reason to think we stand in any other kind of relation to anything which we find dissolved by death.

"But it is said these observations are equally applicable to brutes: and it is thought an insuperable difficulty that they should be immortal and by consequence capable of everlasting happiness. Now this manner of expression is both invidious and weak; but the thing intended by it is really no difficulty at all, either in the way of natural or moral consideration. For, first, suppose the invidious thing, designed in such a manner of expression, were really implied, as it is not in the least in the natural immortality of brutes, *viz.* that they must arrive at great attainments and become rational and moral agents, even this would be no difficulty, since we know not what latent powers and capacities they may be endued with. There was once, prior to experience, as great presumption against human creatures, as there is against the brute creatures, arriving at that degree of understanding which we have in mature age; for we can trace up our own existence to the same original with theirs: and we find it to be a general law of Nature that creatures, endued with capacities of virtue and religion, should be placed in a condition of being in which they are altogether without the use of them, for a considerable length of their duration, as in infancy and childhood; and great part of the human species go out of the present world before they come to the exercise of these capacities in any degree at all. But then, secondly, the natural immortality of brutes does not in the least imply that they are endued with any latent capacities of a rational or moral nature; and the economy of the universe must require that there should be living creatures without any capacities of this kind: and all difficulties as to the manner how they are to be disposed of are so apparently and wholly founded in our ignorance, that it is wonderful they should be insisted on by any but such as are weak enough to think they are acquainted with the whole system of things."

Nor are these the only weighty arguments and considerations which tend to establish the doctrine of the possession by the brute creation of an immaterial principle; in other words, that the "spirit of the beast" is really "a thing having existence," and in a sense different from its mere present or visible life. The following remarks (Prichard, 'Nat. Hist. of Man,' ii. 3) are very forcible: after expatiating on the remarkable contrasts and resemblances (and particularly the latter) between mankind and the inferior tribes, he says, "If it be enquired in what the still more remarkable difference consists, it is by no means easy to reply. By some it will be said that man, while similar in the organization of his body to the lower tribes, is distinguished from them by the possession of an immaterial soul, a principle capable of conscious feeling, of intellect and thought. To many persons it will appear paradoxical to ascribe the endowment of a soul to the inferior tribes in the creation. Yet it is difficult to discover a valid argument that limits the possession of an immaterial principle to man. The phenomena of feeling, of desire and aversion, of love and hatred, of fear and revenge, and the possession of external relations manifested in the life of brutes, imply, not only through the analogy which they display to the human faculties, but likewise from all we can learn or conjecture of their particular nature, the superadded existence of a principle distinct from the mere mechanism of material bodies. That such a principle must exist in all beings capable of sensation, or of anything analogous to human passions and feelings, will hardly be denied by those who perceive the force of arguments which metaphysically demonstrate the immaterial nature of the mind." *

We assume it, then, as established that brutes are in possession of an immaterial principle, a "spirit" or "soul," which is capable, at least in a degree, "of conscious feeling, of intellect and thought;" the existence of which capacity we have found abundant reason for recognising in some of the antecedent portions of our inquiry. It is next for us to ascertain, if we can, whether this capacity is analogous to the same capacity in man or identical with it. In Dr. Prichard's view, "we may venture to conjecture that there may be immaterial essences of divers kinds, and endowed with various attributes and capabilities; but the real nature of these unseen principles eludes our research. They are only known to us by their external manifestations. These manifestations are the various powers and capabilities, or rather the habitudes of action which characterize the different orders of beings, diversified according to their several destinations." (Id. p. 3.) Now these manifestations, considered simply as manifestations of immaterial principles, must of necessity, it would seem, be analogous to the manifestations of that immaterial principle with which we are best acquainted; that is to say, to our own mental proceedings, to the operations of our own intellectual attributes and capabilities. In fact, as much as this is more than implied in our first quotation from Dr. Prichard's admirable book. Bearing this analogy in mind, and rejecting all those of the "various powers and capabilities or habitudes of action

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* The author goes on to say, with seeming inconsistency, "There may be no rational grounds for the ancient dogma that the souls of the lower animals were imperishable, like the soul of man." The allusion probably is to the Pythagorean doctrine of the metempsychosis. Certainly the idea of an immaterial principle or essence, subject to the same laws of decay and dissolution as matter itself, is one hard to conceive, and little consistent with "the metaphysical arguments which demonstrate the immateriality of the mind," or, rather, soul.

characterizing the various orders of beings," which do not come under the category,—are not characterized in any degree by the analogy in question,—I doubt whether we shall find any good ground for entertaining the conjecture that there may be immaterial essences of divers kinds. We have, indeed, already adduced certain considerations which would lead us to entertain a very different belief: nor do we, so far, recognise any which are antagonistic to it. It might, it is true, but not very likely, be otherwise were the difficulties and deficiencies in the way, and the means of prosecuting our research considerably lessened in number and magnitude; but, in the present state of our knowledge it seems superfluous to assume the existence of other intellectual essences when such a very large portion of the known or observed actions and capabilities of animals admit of easy and consistent explanation on the principles of the human mind.

The opinion here stated seems to me to receive a remarkable degree of confirmation from the fact that animals dream. I suppose there are very few persons who have been in the habit of seeing a dog asleep who have not also witnessed the most convincing proofs that the animal was in dreamland: he fights his battles over again; he renews the chase of the rabbit or hare with tongue and limb—possibly even is sensible of the seeming pain of an imaginarily renewed castigation or accidental injury. The bird in the cage, too, dreams, and so does the cat on the knee or the hearth-rug. "By dreams," says Butler, "we find we are possessed of a latent and, what would otherwise be, an unimagined, unknown power of perceiving sensible objects in as strong and lively a manner without our external organs of sense as with them." But is there one word in this sentence that we can change, even if we desired, when we begin to speak of the dreams of a brute instead of those of a human being? And if not, on what principle are we to say that this latent power of perceiving sensible objects without the help of our external organs of sense belongs to one kind of immaterial essence in the case of the human subject, to another in that of the brute?

But, again, dreams have been called the imagination of the sleeping man. Is there any impropriety in applying the definition in the case of the dreaming dog? I certainly see none, and for the best of all reasons, that the dog is most assuredly endowed with the faculty or power of imagination; and, with him, almost every other animal we are sufficiently intimate with to be acquainted with a good number of its actions and habits. What is it which makes some nursery tale—'Little Red Riding Hood,' to wit—so attractive to the child? It is the child's imagination* which makes the scenery, the actors, the incidents, the conversation of the tale, all real: and it is the same imagination which leads the child, in its play, one moment to personate a beast or a bird, and the next its father, or some one else well known to it: and so it is with the dog in its mimic fights or pursuits with its playmates, whether those playmates be canine like itself, or human, or even belong to some other family or tribe of living creatures. The same of the kitten and her fancy-figured mouse, a weakness into which the demure matron tabby, her mother, sometimes descends for a moment; of the young fox, the lamb, the chicken, and so on without end. Indeed, illustrations of animal imagination are sufficiently numerous and striking; but what is there in any one of them to lead us to infer that it is a manifestation of an immaterial essence different in kind from that which is the property of man? I must confess that I cannot see anything which even appears to point to such a conclusion.

It is certainly much more reasonable to subscribe to the sentiments set forth in the following passages:—"I apprehend that no one who considers the subject can doubt that the mental principle in animals is of the same essence as that of human beings; so that, even in the humbler classes, we may trace the rudiments of those faculties, to which, in their state of more complete development, we are indebted for the grandest results of human genius." (Psych. Res. p. 167). And again, "I am inclined to believe that the minds of the inferior animals are essentially of the same nature with that of the human race, and that of those various and everchanging conditions of it, which we term the mental faculties, there are none of which we may not discover traces more or less distinct in other creatures." (Id. p. 170).

A brief glance at our position and that of our argument may not now be altogether out of place. In the former part of it, we were led, by a variety of facts and considerations, not simply to see that a vast number of animals are "no contemptible reasoners," but to admit that they are so in virtue of their possession of the power of comparing, compounding, generalizing or abstracting, and also of communicating their ideas; all, of course, within certain limits or boundaries; those limits or boundaries being possibly somewhat indefinite or indistinct, owing to our imperfect and utterly insufficient knowledge. Later on we have come to a conclusion that would, of necessity, have compelled us to look for just such results as the facts and considerations founded on the facts before mentioned, and that prepares us to look for further results of the same character and of indefinite number, variety and interest, from the moment abler, closer, more concentrated and better organized observation shall be brought to bear on the field of inquiry; results, in short, precisely analogous to those which have followed in the field of astronomical inquiry, so close and so gloriously on the invention and application of new and improved means of discovery, whether mechanical or mental, or both.

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* Macaulay's Essays, art. 'Milton.'

The practical bearing of the conclusion just adverted to on the inquiry we are prosecuting would seem to be something of this sort. If there is a connexion between reason and instinct in man, it is reasonable to conclude there may be the same or a similar connexion between reason and instinct in the brute; and if that connexion always exists in the human species, what ground is there for asserting that it does not similarly exist in the brute family?

It is quite indisputable that instinct and reason do co-exist in mankind, although, at one period—the earliest, namely—of our being, the latter is altogether latent; so much so that instinct may, in a sense, be said to precede reason: while still, no one would ever think of contending that, because for weeks of its life the infant performs and can perform none but purely instinctive actions, therefore it has no share in the possession of the reasoning capacity. But further than this, when the reasoning faculties begin to develope themselves and to be exercised, instinct does not cease to operate. It is instinct which prompts the child, which hitherto has derived its entire sustenance by the act of sucking, to employ its jaws and gums in the attempted action of biting the crust or cake put into its little hands; to drink from the spoon or cup presented to its lips; to use its little limbs in creeping first, and then in its earliest tottering walk; to employ its right hand in preference to its left; and so on. And more than this, other instincts, and of a different character, begin to be developed contemporaneously with the increasingly forcible development of the reasoning or intellectual faculties. What is it which induces the little child to manifest such evident pleasure when placed in company with other children, and by a tacit, but very real, understanding and alliance with them, add to its own resources, hitherto less ample than they might be, of comfort, pleasure and well being? Why, in the words of an author, often referred to already, "the child is led to seek the society of other children by an impulse which he cannot resist, and which is independent of any intellectual operation." (Phys. Res. p. 197.)

Nor do the instincts peculiar to man ever cease to act as long as our life is continued to us, except, of course, in some abnormal condition of the individual induced by severe mental or bodily illness; more frequently the former. By instinct we appease our hunger and our thirst; by instinct we love our parents and our children; and by instinct we associate ourselves into communities, within narrower or more extensive limits, the end or result of which is "mutual society, help and comfort."*

Yes, we may behold that spark of the Divine, man's intellectual powers, or human reason, shining so gloriously in Newton, glaring so stormily in Napoleon Bonaparte, beaming so nobly in Milton, "paling such ineffectual fires" in the poor Digger or Australian; but we behold, too, that no one of all these, that no one of all the countless myriads of mankind, from the mightiest and most renowned to the meanest and most nameless, but has been, whatever his attributes and endowments of mind and reason, a creature of instincts, from the hour of his birth to that of his death: and, moreover, these instincts preceded his reason in his early infancy, and in multitudes of cases, they outlasted his reason during the closing "days of the years of his life."

And if we are to be guided by analogy in our inquiries and researches, in my opinion the inference or induction to which we are forcibly impelled by what we have, alike by the natural results of thoughtful observation and by a train of independent reasoning, been led to admit as to the identity of essence of the mental principle in man and in the inferior orders of animals, is that, in the brute creation, too, instinct and reason co-exist; that, at least, with certain limitations, and subject to certain definitions, instinct presupposes reason.

And here, possibly, it may serve, partly in the way of illustration, and partly, may be, in the way of confirmation of our inference, if we regard the endowment or faculty of instinct from a somewhat different point of view. In our former paper we considered instinctive actions rather as contrasted with rational actions and with mechanical actions. Let us now consider them as to their own essential character, as to what they are in themselves. We shall certainly not be accused of mis-statement if we allege that, without an exception, purely instinctive actions are directed—not by the intention of the individual agent or agents immediately concerned, but under an immutable law of creation—to the end of promoting the well-being and preservation of the individual or to the continuation of the species. Under this law, the bird of passage migrates as well as builds its nest; the salmon revisits its native streams and deposits its spawn in their head-waters; the young dog or ferret acknowledges the scent of its destined prey, and employs its physical resources in the attempt to capture it. Under this law, too, the bee builds its comb as nicely and correctly as though guided by exact mathematical science and enabled by the highest mechanical skill; the ant-lion constructs its pit-fall; and a third insect, after depositing its egg in the prepared cell, inserts likewise two or three grubs, paralyzed but not killed, lest they should decay and so defeat the object of their captor, to serve as the unresisting food of its offspring until such time as it shall cease to be a grub itself. While to this same law, likewise, must be referred the several instinctive actions, or series of actions continually performed by mankind. But, in the last-mentioned instance, reason, at a very early period, as we have observed, is known to supervene, and, progressively advancing in activity and vigour, ultimately assumes dimensions of such magnitude and so conspicuous that it altogether dominates and throws into shade each of the simple instincts; always excepting the case of the more or less completely uncivilized, or of those in worse condition still for the evolution of the higher characteristics of humanity, the more or less completely demoralized. And why? Beyond all question, because only by the due development of human reason, differing widely, no doubt, both as to original endowment and subsequent cultivation or improvement, in different communities,—and as widely, too, in different individuals in the same community,—can those functions and duties be discharged which it pleased the Creator, after He had made man in His own image, to allot to him as the part he had to fulfil in the great general scheme of creation. And as to the other instances quoted, how stands the matter with them? Is it quite certain there is no analogous or even similar progression of what clearly is not instinct, and as clearly can be nothing short of some degree of reason? Nay, is it even certain that, in the great scheme of the Allwise, there may not exist a necessity, similar to that we have noticed in the instance of mankind, that the inferior orders of animals should be possessed of, and capable of developing and even improving, each of them their own appropriate measure or degree of intellect? As for myself, I feel pleasure in stating the entire coincidence of my own sentiments with those I now proceed to subjoin:—"It is in the proportion which their instincts and intelligence bear to each other that the difference between the mind of man and that of other animals chiefly consists. Reasoning is not peculiar to the former, nor is instinct peculiar to the latter. Even as regards insects which are generally and properly regarded as being below the vertebrate animals in the scale of existence, and whose nervous system is of so simple a structure as to admit of no comparison with that of the human subject, we cannot well hesitate to believe that they are not altogether deprived of that higher faculty which enables ourselves *to apply the results of our experience to the new circumstances under which we are placed.* * * * We see, among the Mammalia and birds, *even those which are the least intelligent*, nevertheless *availing themselves of the lessons of experience, and adapting their proceedings to the new circumstances under which they are placed.*" (Phys. Res. pp. 189, 194.)

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* "The desire to live in society is as much an instinct in man as it is in the bee, or the ant, or the beaver, or the prairie dog."—Phys. Res. p. 196.

I ask attention to the italicised portions of this extract, in connexion with a very few further remarks. The flycatcher mentioned below* migrated by instinct, paired by instinct, built its nest and incubated its eggs by instinct; but did not frequent its own peculiar post (see Yarrell, *in loco*) or bar or branch by instinct, and still less procure shelter from the scorching beams for its young by its own panting exertions and self-sacrifice by instinct. Experience in the former case—the same experience which leads the human seeker after insects to the places he has found most fertile in producing them—and in the latter, observation and thought or reason, or the results of them, were the motives in operation. Again, the bee might build its wonderful cells by instinct, but it was not instinct which induced it, when the comb, unable to bear the weight inclosed, gave way and began to separate—the lower portion from the upper—to build a pillar of support beneath the portion in danger of falling, and that done, then proceed to fill up the space occasioned by the fracture, making good the rent, and conclude by removing the support when the repairs above rendered it no longer necessary.

A volume of similar illustrations might, with no trouble, except that of selection, be compiled; but, instead of adducing any others, I shall rather remark that most persons, not much accustomed to systematic thought on this subject, and indurated by unquestioning habit in the familiar dogma that mankind act by reason, and by that are distinguished from the brutes, which act by instinct, would probably be much amazed if they could be induced to sit down, pen in hand, and commit to paper a list of the undoubtedly instinctive actions of any given wild animal or selection of animals,—amazed, I mean, not by the wonderful nature of the actions registered, wonderful as many of them would be, nor yet by the long list made out; but by the very limited number they would be able to insert in the list. Take the fox, the hare, the partridge, the sparrow, for instance,—creatures specified because as familiarly known to us as any in the whole long list of God's creatures,—and how many of their customary and habitual doings may be put down under the head of instinct? By instinct they pair and copulate, they prepare for their young, they satisfy their own hunger and thirst, they supply the similar wants of their young, they dread danger, and so on. But what a countless train of actions (even after setting aside all doubtful cases) is there in the record—imperfect even when kept by the closest, most patient observer—of their lives, in which, if they were human and not brute, we should never for an instant dream of questioning the influential presence of comparison, recollection, consideration, contrivance, calculation and other operations of understanding, of reason, acting in co-ordination with, possibly even in dependence upon, instinct.*

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* A spotted flycatcher had built its nest in a grape-vine trained to the wall of a house. By some chance the leaves which screened the nest had died or been removed: the young brood were much distressed in consequence by the heat of the sun, increased as it would be by reflection. The parent bird was observed fluttering for hours together during the hottest part of the day, so as to interpose herself between her fledglings and the sun.

But I turn to a new line of consideration and argument, which also may be found illustrative, and possibly confirmatory, of the doctrine that instinct presupposes reason. In all the observations and remarks hitherto advanced we have dealt with what are simply the every-day actions of the brute, whether living in a state of nature, or more or less influenced by the results of domestication; and we have not so much as alluded to the effects produced on him by special and careful training or instruction. From the moment, however, we enter upon this new topic, strictly germane to our subject, a field of observation and inquiry, of great interest, is opened to our regard. The results of training or education, in the case of every animal on which it has hitherto been tried, are simply wonderful. We know, well enough, what education does for our own species: what it does in the case of the lower animals can hardly be said to be less in proportion. To pass by the accounts of the "wonderful fleas," lately, if not still, one of the standard "sights" of the metropolis, and entirely marvellous from the perfect discipline and other results of training induced in what one would unhesitatingly pronounce such unlikely subjects for successful educational experiment; and to pass by, too, the "learned pig," not because unworthy of our attention, or that his feats are irrelevant to the matter at present in hand,—for the converse of this is entirely true,—but because we propose to take our illustrations from another source: we beg attention to the following account of some performances by a "learned dog:"—"The dog was a well-fed, comfortable-looking kind of a bull-terrier, slightly rough about the muzzle. * * * On entering the hall, he cast a kind of hasty look about him, much as you would expect a rogue to do on entering a shop from which he intended to purloin something: however, on the woman producing certain dirty cards, with their corners all worn round by constant use, and marked with numbers, letters, &c., the dog prepared himself for action with a preparatory lick at his lips and a suspicious look at his mistress. The tricks consisted of the usual routine of adding up figures, spelling short words, and finding the first letter of any town named by one of the company. The last trick was very cleverly done, and puzzled us very much, as we—*i. e.* the grown-up part of his audience—were most intently ~~watching,~~ not him but his mistress, in order to discover what signs she made to guide him in his choice of the cards; but we could not perceive that she moved hand or foot, or made any signal whatever. Indeed, the dog seemed to pay little regard to her, but to receive his orders direct from any one who gave them. In fact, his teaching must have been perfect, and his intellect wonderful. Now I daresay I shall be laughed at for introducing an anecdote of a *learned* dog, and told that it was 'all trick.' No doubt* it was 'all trick,' but it was a *very* clever one, and showed how capable of education dogs are—far more so than we imagine. For here was a dog performing tricks so cleverly that not one out of four or five persons who were most attentively watching him could find out how he was assisted by his mistress. The dog, too, as the woman said, was by no means one of the kind easiest to teach."—'Tour in Sutherland,' ii. p. 198.

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* I quote the following from Mr. Couch, in illustration of the text, but without intending to imply a perfect accordance of opinion with him all through:—"A predominant error in the minds of those who deny to the inferior animals the capacity of reasoning, is the omitting to take into account a possibility of the existence of instinct in connexion with it; or that it may lie at the foundation of that building of which the rational faculty is the consummation." ('Illustrations,' p. 184.) And again, "In the proportion in which it (a reasoning faculty in animals) exists I shall have to show that its sole appropriation is as the servant of instinct, to guide the latter in its development."—Id. p. 163.

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* I scarcely assent to the indubitableness of its being "all trick."

If we desire to multiply instances of this kind,—and without adverting to the multitudes of tricks and performances enacted, some of them quaint, some clever, some almost startling, by pet dogs in almost every village in the country,—we have but to go to the next performance of some tolerably good equestrian *troupe*, and we shall see quite sufficient to convince us that there is scarcely anything which the horse may not be taught; that he is capable of learning almost anything which it may suit the whim of his trainer to teach him.

Nor is this wonderful capacity for receiving and retaining the impressions of teaching or training to be met with exclusively, or nearly so, in animals not only themselves domesticated, but, in addition to that, the descendants of generations of domesticated creatures, and so, it may be said, prepared for the reception of such impressions; but it is common in those of which it can scarcely be said that they are reclaimed in the first degree. The whole science and practice of falconry depended on the successful training of birds reared from the nest and eggs of parents utterly wild. The same, too, of the young otter taught to fish for its master; of the young seal instructed in the same lesson, not an easy one to learn; of the cheetah, or hunting-leopard, of the East; of the cormorant, systematically employed in fishing by the Chinese, and, not systematically, by one here and there nearer home; and so on. Indeed, one might almost say there seems to be no practical limit to the successful teaching or training of animals; for you do not seem to be at all necessitated to confine yourself to the line apparently suggested, as promising most for success, by the animal's natural habits or instincts.

And here another consideration suggests itself rather forcibly to our attention. The result of teaching or training an animal, or series of animals, in a continuous and systematical manner, induces a change in the mind of the said animal or animals so great that new features in the distinctive nature of that class or breed of animals assume existence and become strikingly manifested. What is styled an hereditary instinct* is developed. This is met with in many different animals, but most prominently in the dog. The wonderful and peculiar sagacity of the sheep-dog, the distinctive characteristics of the pointer and setter, to leave unmentioned the peculiarities of other varieties of the dog, quite sufficiently pronounced and remarkable, however, to dictate the familiarly specific nomenclature of the animals in question, are cases in point. The result is that the young of these varieties take to their special duties with great ease, or almost naturally, requiring very little teaching or "breaking," and occasioning their trainer comparatively but little trouble. No doubt other dogs besides the pointer and setter may be taught to "stand." I had a large spaniel whom I succeeded in training to do so, and I knew a remarkably sagacious water-spaniel, much shot to as a retriever, who acquired the habit of herself, and pointed with great steadiness. But this, to me, appears to be an additional confirmation of the theory of hereditary instinct, by explaining the way in which the original pointer, setter, springer, turnspit, &c., were formed.

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* "Hereditary instincts may be formed, some animals transmitting to their offspring acquired habits, and the psychical as well as the physical characters of races undergoing variation through the agency of various causes on the breed."—Prichard, p. 40.

Now it is axiomatic enough that the teacher must have something to work on, or his teaching will come to no result. In the school of boys and girls, we know well enough what he has to work on, and he will tell you that he can do the best with the cleverest or the most attentive; that is, with those whose intellectual faculties are the best adapted for receiving and retaining the impressions it is his object to convey. But the presence of intellectual faculties will be implied in what he tells you of every individual child in the school-room, whether he speaks of the lowest and dullest of his scholars or points out what our Scottish friends call the "dux" of the school. Were he to point out a child incapable of learning, he would add, "but he has no brains, no understanding, no intellectual faculties at all." The very capacity, then, to receive instruction and evince so remarkably the results of training, most manifestly possessed by so many of the brutes, is, in my view, a most convincing proof that they, too, have intellectual faculties to work on, an understanding to conceive, and mental powers to operate the teaching afforded. No doubt some will be easier taught than others,—I mean individuals in a species or family,—just as, indeed, we know that some species in the same genus are more intelligent than others, and some tribes much less gifted with sagacity than others. But our opinion that reason belongs to the lower orders of animals, in virtue of a joint possession with mankind of an intellectual essence, is not hereby shaken. Indeed it is rather confirmed, for we note the same thing as continually occurring in the human family itself, and not at all excluding hereditary peculiarities from the category. It has occurred to me, through a tolerably intimate acquaintance with village schools in many different parts of the kingdom, to become aware that there is a vast difference between the intellectual condition and adaptability of the children of different districts; and I believe that I am not at all singular in thinking that I could trace out the reason thus: wherever the class of parents were, generally speaking, unintelligent, with minds in a state of immobility and apathy,—whether from the want of teaching when themselves were children, or from other and more physical causes,—then the children were slow, heavy and dull of apprehension, as well as more difficult to train and discipline. On the contrary, when the parents were intelligent and acute, and in favourable circumstances as to self-support and self-respect, and although they might be mainly ill-educated or very little educated, still the children were apt, quick, intelligent and easily taught.

Nor do I think there is anything extravagant or unreasonable in such a theory. For we have but to observe what is the notorious result of no teaching or training at all, or of teaching and training in a downward direction, to become aware what a disastrous shipwreck is made of all the better and nobler attributes of man. Follow the depraved and hardened offender into his dens and hidden places of resort, and you see him a brute in almost all, articulate speech and his hand only excepted. Much as the brute lives, lives he; with the same—nay, worse than the same—instinctive lustings after meat and drink; with the same unconcern as to the concealment of what among the least civilized races of man, if uncorrupted, nature itself is said to wish to hide; with the same passions and desires as animate the beast of prey; and with only much the same acumination of intellect as might distinguish a lion or tiger that had graduated, a "first-class" brute, at some Oxford or Cambridge, the *Alma (?) Mater* of the youthful Felidæ.

Go again, and look at the outcasts of a tribe or people, the Diggers, for instance, the Bushmen and such of the Australian natives as are yet known to us. But I will content myself with an account of the habits of the Bushmen, derived from Dr. Prichard's book:—"Of all species of men, this race, approaching as it does in its form most nearly to the second genus of bimanous animals, is still more closely allied to the orangs through the inferiority of its intellectual faculties. Happily for themselves, these people are so stupid, lazy and brutish that the idea of reducing them to slavery has been abandoned. Scarcely are they able to carry on any train of reasoning, and their language, as bare as their ideas are scanty, recedes into a kind of murmuring, which bears scarcely any resemblance to the human voice. Of habits so filthy as to render them infectious, always moist with sweat or reeking with their own urine, * * * * clothed in skins of beasts that have passed through no process of preparation, living upon wild roots or flesh and entrails, not even washed before conveyed to their mouths, spending their life in sleep or squatted and smoking, they occasionally wander with a few cattle which supply them with milk. * * * * They scarcely make any application of fire, except to light their pipes. The domestic hearth is all but unknown among them."* (Id. p. 514). "No picture of human degradation and wretchedness can be drawn which exceeds the real abasement and misery of the Bushmen, as we find it displayed by the most accurate writers who describe this people. Without houses, or even huts, living in caves and holes of the earth, these naked and half-starved savages wander through forests in small companies or separate families, hardly supporting their comfortless existence by collecting wild roots, by a toilsome search for the eggs of ants, and by devouring, whenever they can catch them, lizards, snakes and the most loathsome insects. It is no matter of surprise that those writers who search for approximations between mankind and the inferior orders of creation fix upon the Bushmen as their favourite theme." (Id. p. 515.) "The desire of revenge is one of the strongest of their passions: it urges them to the most barbarous acts; they commit the most frightful outrages under the impulse of momentary irritation. * * * * Their eagerness for vengeance is so urgent as to render them indifferent on whom they wreak it, provided the sufferer be of the same country as the offender." (Id. p. 603.) †

Perhaps this picture is the darkest that can be drawn of a state of abasement and wretchedness to be actually the daily, living experience or lot of human creatures: many, however, of its very darkest lineaments belong to the portraiture of the condition, mental and physical, of several other tribes or communities or peoples. Who, then, can wonder that some philosophers have thought to lessen the great difficulty presented by the existence, the habits, the very language, of such specimens of humanity, by suggesting some origin for them different from that of more intellectual and less brutish nations or tribes. But we believe it is now a very firmly established opinion that their low, miserable, degraded, scarcely human condition, is due to progressive demoralization consequent on their being driven out and treated as outlaws by their own people at some remote epoch. "The tests," says Dr. Carpenter, in the introductory chapter of his 'Human Physiology,' "by which we recognise the claims of the outcast and degraded of our own, or of any other highly civilized community to a common humanity are the same as those by which we should estimate the true relation of the Negro, the Bushman or the Australian to the cultivated European. If, on the other hand, we admit the influence of want, ignorance and neglect in accounting for the debasement of the savages of our own great cities,—and if we witness the same effects occurring under the same conditions among the Bushmen of Southern Africa,—we can scarcely hesitate in admitting that the long-continued operation of the same agencies has had much to do with the psychical as well as the physical deterioration of the Negro, Australian and other degraded savages. * * * * All the evidence which we at present possess leads to the belief that, under a vast diversity in degree and in modes of manifestation, the same intellectual, moral and religious *capabilities* exist in all the races of mankind."

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* From the French of M. Bory de St. Vincent.

† I do not avail myself of the accounts given of the race of Dokos or Pygmies, said to inhabit certain forest-lands in Africa, as they are not quite free from doubt; but the narrative is very startling. See Prichard, p. 554.

Or again; with respect to infants or children deserted by their parents, or otherwise deprived not only of parental but of all human care whatever, and who—the units in thousands—have survived the exposure, and contrived to maintain an existence, however precarious: —with all their human attributes, with all their claims to man's heritage of intellect and reason, they have been no better, for the most part, than "the beasts that perish." They could be taught to speak but, at the utmost, a few nearly unintelligible words. Self-control and self-guidance were as little characteristics of theirs as of "the horse or the mule" mentioned by the Psalmist. In fact, they have been, so far as we are able to judge from what we know of the savage of Aveyron and others in like case, but melancholy monuments of the utter ruin which befals man's supremacy when he is shut out from a participation in that fostering care and those potential means by which his intellectual superiority is, in the first instance, reared and established, and in the second, secured to himself and his descendants after him.

On the whole, then, our conclusion that instinct, in the case of the lower animals, pre-supposes reason,—understanding by that word an emanation from, or the operation of, an intellectual essence identical with that belonging to man,—appears to us to be not a little confirmed by attentively observing the effects produced, as well by the silent teaching of association as by careful and systematic training, upon the mind, the habits and the nature of the brute creation; effects, moreover, as we have seen, remarkably analogous to what are produced under similar circumstances in the human subject. While, on the other hand, if it be attempted to raise an objection against our conclusion on the ground, that if the brute family were really endowed with reason, they could not continue in a condition so low as theirs is by contrast with the human family,—we reply that the degree of intellectual hebetude which is induced in man, even among civilized nations, by a low physical condition and the continued want of mental culture and moral training; of utter demoralization, both mental and physical, when that want is assisted in its operation by practical teaching in wickedness, and training of the faculties in a downward direction; or still more of complete degradation, even to the level of the brute, which is the result of utter deprivation of all kind of human care and human intercourse, with its necessary though tacit educational power; at once proves that there is nothing abnormal or even remarkable in the condition of the lower orders of animal creation, as contrasted with their presumed possession of the attributes of reason.

While engaged upon the arguments and considerations, now brought to a close, other questions, at least collateral to that we have discussed, have suggested themselves; such as how far the reason of brutes is to be regarded from Mr. Couch's point of view, namely, that it is simply "the servant of instinct;" in what sense or degree the brain may be considered as the organ by which instinct works; the extent to which instinct works in the human races, civilized and uncivilized, and is susceptible of changes similar to those implied in the words "hereditary instinct," and the like: to which, or to some of which, we may possibly revert in some future paper.

There is another topic on which it may be thought necessary—though, I own, it does not appear so to me—to add a few passing observations; I mean the distinctive difference between man and the brute. Admitting all that we have contended for relative to the intellectual endowments of the lower animals and the corollaries deducible from it, to the very fullest extent, the relative position of mankind and all other animals remains, of necessity, quite untouched. The superiority of man over the mere animal is a fact; and no fact can be touched by any mere process of reasoning. The distinction between the human and the brute families is as broad and as strongly marked as though the object of the Creator had been simply to display that distinction in the most striking manner. By the unalterable fiat of the Great Author of all the one was constituted the sovereign of the other; and the sovereignty so established must abide unassailable so long as the fiat is unrevoked. And, like all other decrees emanating from that authority, it carries the essential elements of its own completion in itself. Man's hand, no less than man's language, the mechanical engine and the intellectual instrument, each—so to speak—supplementary and auxiliary to the other, effectually maintain, —nay, rather, progressively widen—the impassable gulf fixed from the beginning between man, the ruler, and the rest of creation, the subjects. What has the most sagacious, the most intelligently-acting brute; the dog that almost talks to you and quite understands much that you say; the oran, which has been taught to stitch its own clothes and to sit at table with a propriety and cleanliness never dreamed of in hundreds upon hundreds of not the least refined households, their members not the coarsest mannered, in civilized England or France:—what have they to compare with the hand of man? The various tribes of animals which accompany man in his migrations over the face of the globe, and by their wonderful capability of successive or gradual adaptations to new climate, new food, new circumstances, seem almost to superinduce a new nature; those other animals which hand down through their posterity, and with increasing force, their own peculiarities of habits or instinct, an intellectual property entailed on each of their descendants;—what have they to set against man's supreme faculty of comparing and compounding the elements of knowledge; of imparting to others, his contemporaries, or his successors, after the lapse of centuries, the elaborated results; of transmitting from generation to generation an ever-accumulating immensity of practical experience, experimental knowledge and abstract philosophy of every varied description? And all this, be it observed, quite apart from the contrast involved in the one word "hereafter." To the mere animal there is the love of life—to man, the desire after immortality: the instinctive longing, or yearning, rather, of the latter is for something commensurate with the capacity and the duration of "the conscious living agent, himself," and which he feels rather than knows is reserved only, but surely, in the mysterious recesses of Eternity; that of the former reaches no further than food, well-being, safety, the mere requisites of the life that now is.

I will add no more than the following passage from the writings of Sidney Smith, perhaps as appropriate as any that could be written:— "I confess I treat on this subject (the *anima brutorum*) with some degree of apprehension and reluctance, because I should be very sorry to do injustice to the poor brutes who have no professors to revenge their cause by lecturing on our faculties, and at the same time I know there is a very strong anthropical party who view all eulogiums on the brute creation with a very considerable degree of suspicion, and look on every compliment which is paid to the ape as high treason to the dignity of man. There may perhaps be more of rashness and of ill-fated security in my opinion, than of magnanimity or of liberality; but I confess I feel myself so much at my ease about the superiority of mankind—I have such a marked and decided contempt for the understanding of every baboon I have ever seen—I feel so sure that the blue ape without a tail will never rival us in poetry, painting and music, that I see no reason whatever that justice may not be done to the few fragments of soul and tatters of understanding which they may really possess. I have sometimes perhaps felt a little uneasy at Exeter Change from contrasting the monkeys with the 'prentice boys who are teasing them, but a few pages of Locke or a few lines of Milton have always restored me to tranquillity and convinced me that the superiority of man had nothing to fear. * * * * What have the shadow and mockery of faculties given to beasts to do with the immortality of the soul? Have beasts any general fear of annihilation? Have they any love of posthumous fame? Have they any knowledge of God? Have they ever reached in their conceptions the slightest trace of an hereafter? Can they form the notion of duty and accountability? * * * * Is it no reason to say, that because they partake in the slightest degree of our nature, they are entitled to all the privileges of our nature? because upon that principle, if we partook of the nature of any higher order of spirits, we ought to be them and not ourselves, and they ought to be some higher order still, and so on. * * * * As facts are fairly stated, and boldly brought forward, the more all investigation goes to establish the ancient opinion of man before it was confirmed (?) by revealed religion, that brutes are of this world *only;* that man is imprisoned here only for a season to take a better or a worse hereafter as he deserves it. This old truth is the fountain of all goodness and of justice and kindness among men; may we all feel it intimately, obey it perpetually, and profit by it eternally." ('Moral Philosophy,' pp. 238, 272.)

J. C. Atkinson.

Danby Parsonage, Grosmont,
York.

Notes on British Bats.—Of the seven species below enumerated, six, it will be observed, were taken in the house (which is only a small one) and the yard adjoining to it. The Noctula, being a high-flying kind, and not, I believe, frequenting buildings, I shot about one hundred yards from the house. The occurrence of so many kinds in such a limited space appears to me, according to what I gather in the 'Zoologist,' to be an uncommon circumstance, though perhaps it might not be so if those animals did not so easily escape observation:—

1. V. Noctula. Common.
2. V. pipistrellus. Common.
3. V. Nattereri. In the spring of 1855 one of this kind, together with V. barbastellus and two or three V. pipistrellus, were caught in the crevices over an open archway in the buildings surrounding my stable-yard.
4. V. barbastellus. One specimen caught as above. Last June I found a small colony of six or seven in the same place: I caught two of them, and did not find the others there again.
5. V. auritus. A specimen found on a water-barrel in the stable-yard with one wing injured; another flew into the house one evening last summer.
6. V. mystacinus. A specimen caught in the kitchen in August, 1855; another in the dining-room and another in the back-yard last July.
7. V. emarginatus, *i. e.* the species described under that name in Jenyn's 'Manual of Vertebrate Animals,' but which, it appears, is wrongly named. A specimen of this bat flew into the drawing-room window one evening in July, 1855.

The only book of reference I have had on the subject has been the one above-named, but each kind corresponds perfectly with the particular description there given of it.—*J. H. Jenkinson; Dripshill, Upton-on-Severn, February* 24, 1857.

Anecdote of a Dog.—When paying a visit the other day at a house in this neighbourhood, I noticed the presence of a new inmate, a large, tail-less, rough water-spaniel-looking dog, only with a snout somewhat too acuminated to belong to a water-spaniel. I found there was a history to this dog: he had belonged to a lately-deceased son of the person I was speaking to, and had, after his master's death, shown much unwillingness to leave what had been the scene of his life and occupation. His master had been a butcher, and had trained his dog to watch his shop for him when he himself was forced to be absent for a time. The dog was rigidly faithful and honest on all such occasions; but more than this—he was customarily shut up all night in the shop with the meat, and was never known to have failed in the slightest degree in his honesty and abstinence. As to his tail-lessness, there was no appearance of his ever having had that wonted appendage to a dog's hind-quarters, a tail. Bell, in speaking of the shepherd's dog, says, "The tail, in some individuals, is very short,—a peculiarity which appears to be perpetuated from parents whose tails have been cut." This dog had not so much as the apology for a tail which a stump or even a scar might have presented. I was, by this little narrative, reminded of a somewhat similar, but still more remarkable, account given me by the officer in the Indian army I have in a former paper referred to. He said it was customary with hunters in Newfoundland when out on a hunting expedition, previously to setting forth on the serious business of the hunt, to leave part of their equipments, &c., at some hut or shanty in the woods, under the charge of one of their dogs; that they left the dog's food, divided into as many portions as they expected to be days absent; and that on no occasion, if they happened to return before the allotted days were expired, did they fail to find the right number of portions of food remaining: the dog had taken his meal per day, and no more, although, in all probability, had he only obeyed his instinct or his appetite, he might have eaten two or three portions and still have been not insensible to the seductions of a few tit-bits, had a dog's-meat man been there with his stores to seduce him. I thought the account afforded a very singular illustration, not simply of the intelligence of the dog, but of his capacity to apply as well as receive and understand the directions of his master. I believe, in the case of a human guardian, whether of the butcher's meat or the hunter's equipments, we should be apt to say, if as much could be said of him as of these dogs, that his "moral sense" was no mean one.—*J. C. Atkinson; Danby Parsonage, Grosmont, York, February* 10, 1857.

Singing-Mouse.—Some years ago I remember having heard of a singing-mouse: I fancy it was exhibited somewhere in London; I certainly then had doubts as to the truth of the report, but must confess since then my opinion is greatly changed. Some short time since I met, at a friend's house, a gentleman who asked me the question, "Did you ever hear a singing-mouse?" I said "No." He answered, "I have one: I will tell you all about it. Two or three months ago I had occasion to go into my game-larder one morning, and was surprised to hear a singular, low, warbling kind of note proceed from the corner of the room; I asked one of my servants, who was there, if he knew what it was: his answer was, 'No, sir; it is something in the wall: we often hear it.' I suggested 'Surely, it might be a singing-mouse,' and it appeared to be in a meal-tub, which I was told was quite full; however, I had the tub moved, and, from underneath it, started a mouse, which escaped by getting into a hole in the wall. That night I had a trap set, and caught the mouse, which proved to be the singing-mouse, for, on being brought into my room, he commenced his warbling, and has continued to do so (of course with intervals of rest) ever since." Last Monday a brother clergyman and myself drove to Captain Mead's, of Earsham Hall, Bungay, Suffolk, to see his mouse, and moreover we heard it sing, that is, upon being stirred up and driven from its nest of wool, it commenced a low, warbling, chirping kind of noise, quite loud enough to be heard across the room; it reminded me much of the note one sometimes hears of the hedgesparrow when singing or commencing to sing in early spring, buried in the ivy of an old fence. The butler informed me that, as the day was cold, the mouse would not sing half so loud as he did sometimes. I must confess I was agreeably surprised; the mouse certainly did what I never heard a mouse do before. Now my impression is, this extraordinary noise is made by the grinding of the teeth, and yet, on looking close, you might observe a heaving of the throat, as if it were a guttural sound, yet I was told he sings particularly when feeding. It strikes me it is not caused from any pleasurable account, for when driven from his nest, and evidently frightened, still the singing continued, but that is just as curious with regard to some of our warblers: if you want to find whereabouts the nest of the reed warbler is situated, a stone or two thrown into the reeds soon causes the male bird to sing, and the nest is sure to be within ten or a dozen yards of the place. But I must conclude, as I am running away from my subject: first, I must just say another mouse has been heard in the same place. In appearance it is, I should say, rather larger than the common mouse; the tail longer, thicker and more blunt at the tip, and the nose less pointed, more snoutish or pig-fashioned.—*John Farr; Gillingham, Beccles, Suffolk, February* 6, 1857.

Occurrence of the Harvest Mouse (Mus messorius) *in Cornwall.*—Neither Mr. Bell nor Mr. Jenyns record the harvest mouse as having been found in Cornwall: it is found in this neighbourhood, and I yesterday caught one from a corn mow: it was very active, and showed no symptoms of torpidity.—*Edward Hearle Rodd; Penzance, February* 21, 1857.

Note on Parus major.—I have often observed tom-tits tapping, as noticed by Captain Hadfield (Zool. 5426). They are not like the woodpecker when thus engaged bringing to the surface insect-food, but they are actually cracking nuts, which is a much more difficult proceeding. The stone of a haw-berry or some other small fruit is carried by Tommy into the tree, and being fixed in some convenient niche, he brings down upon it the full weight of his sharp beak in repeated taps until he breaks the shell and gets at the kernel. Any day in autumn he may be found thus occupied; I have often observed the whole process, and some years ago sent an account of it to the 'Gardener's Chronicle.'—*C. R. Bree; Stricklands, Stowmarket.*

Occurrence of the Tree Sparrow in Devonshire. — A few days since, when examining a lot of small birds exposed for sale in the Plymouth Market, I was much pleased to find among them two specimens of the tree sparrow (*Fringilla montana*), never having before observed the species in Devon. I ascertained that they were killed among other small birds on a farm in the neighbourhood.—*John Gatcombe; Wyndham Place, Plymouth, March* 28, 1857.

Note on the Black Redstart.—In some remarks on the black redstart (*Sylvia tithys*), in the 'Zoologist' (Zool. 5426), Mr. E. H. Rodd seems to suppose that the gray margins disappear from the feathers of an adult male in summer plumage. During the time I have spent in Germany, I have had numerous opportunities of examining specimens of this pretty bird, and although in some examples the gray margins were much less strongly defined than in others, in no instance were they altogether wanting. I quite agree with Mr. Rodd in believing that Sylvia tithys exhibits very closely the connexion between the Saxicolæ and Sylviadæ: a link still more conspicuous, however, is found in the bluethroated warbler (*Sylvia suecica*).—*Henry Smurthwaite; 8, Rossplatz, Leipzic, February* 7, 1857.

PS. In my notice of the wagtails (Zool. 5425), for "Reudendorf," read "Rendendorf," and for "Elsher," read "Elster."—*H. S.*

Occurrence of the Blackcap Warbler, throughout the Winter Months, near Penzance.—The blackcap warbler has remained with us, in sheltered valleys near by, all the winter: two days ago it was seen in full activity, searching for food, but without music.—*Edward Hearle Rodd; Penzance, February* 21, 1857.

Change of Plumage in Motacilla alba.—In reply to Mr. Carter's query with respect to the change of plumage in M. alba during the winter season (Zool. ——), I may observe that in the female such a change does take place, and in a very decided degree: the whole plumage is at that time considerably lighter in colour, and the rich black which, in the breeding season, covers the upper part of the breast and throat, is in winter much diminished, both in extent and depth of hue, assuming then the form of a crescent, the outer feathers of which are of a dull gray. With regard to the male bird, I am not enabled to speak with certainty, but have no doubt that some change takes place in its plumage also.—*Henry Smurthwaite; 8, Rossplatz, Leipzic, March* 17, 1857.

Occurrence of Rare Birds near Plymouth in 1856.—During the past year the following rare birds have been obtained near Plymouth:—In October the great snipe (*Scolopax major*) was captured by a labourer, at Slade, the residence of Captain Pode; during November four specimens of the black redstart were killed, and more seen; in December the little auk, forktailed petrel and several common bitterns were obtained. I have noted, for many years past, that the black redstarts appear on the coasts of Devon and Cornwall invariably the first or second week in November, and leave at the end of March or the beginning of April: these birds closely resemble the wheatear in their actions, and, as it were, take the place of that species during the winter months on the coasts, but of course they are not nearly so numerous. I once took from the gullet of a black redstart a large specimen of Ligia oceanica, an animal much resembling the common woodlouse, but larger, and which may be seen creeping on the rocks near the sea.—*John Gatcombe; Wyndham Place, Plymouth, March* 28, 1857.

Note on the Sabine's Snipe killed in Norfolk.—Having had the opportunity of examining the Sabine's snipe mentioned by Mr. H. Stevenson (Zool. 5427), whilst in the flesh, I venture to send you the following additional particulars, as many well-founded doubts have of late subsisted, questioning the title this snipe holds to being a distinct species from S. gallinago. I was especially careful to take the measurements, &c. before the bird was skinned; in doing so, every facility was afforded me by Mr. Baker, the naturalist, of this town: these measurements I give below in detail, in order that any reader of the 'Zoologist,' who may be interested in the bird, may have an opportunity of comparing them with those of S. gallinago, and thereby see for himself the close structural similarity that exists between the two; not that any satisfactory conclusion could be arrived at by merely taking one of the common species, but by taking a series, say of five or six, or even more, it will be found that there will be as much variety between any two of the series as between the measurements of this bird and any one of them. I have not been able to see more than one other specimen, and therefore am unable to see, from the birds themselves, whether they are subject to any variety, but, from a comparison of the coloured plates and descriptions given by various authors, it would seem that such is the case. Mr. Vigors (Linn. Trans. xiv. p. 556), in describing the original specimen, says that "this species is at once to be distinguished from every other European species of Scolopax, by the total absence of white from the plumage, or any of those lighter tints of ferruginous-yellow which extend, more or less, in stripes along the head and back of them all:" to which I may remark, that the tip of each feather of the back is of a much lighter colour than the other transverse bars, which are chestnut; in every other respect the plumage agrees with the description given by the late Mr. Yarrell ('British Birds,' iii. p. 23), the only addition to which I can make is, that the under surface of the wing is of an uniform dusky black, without spot or marking, and the colour of the leg is an olive-green, not "very dark chestnut-brown," which probably was taken from a stuffed specimen. Mr. Gould, in his 'Birds of Europe' (vol. iv. pl. 321), figures S. Sabini with traces of the longitudinal marks which run from the beak under and above the eye; the upper plumage of his drawing is not so distinct in its general character. The bird figured in Jardine and Selby's 'Illustrations of Ornithology' (pl. 27) is lighter and browner about the head and back of the neck; the tail also is of a light colour at the tip, much resembling, in this respect, that of S. gallinago. That figured by Meyer (pl. cxcii.) is lighter on the breast, and the markings of the lesser wing-coverts are not so strictly lateral. Macgillivray (Brit. Ornith. p. 377) says, in his description, that the upper part of the head and hind-neck are brownish black, spotted with dull chestnut-brown: in the present bird the brown spots do not exist. The above differences are slight, it is true, but all tend to show that the plumage is not constant, and when we consider to how much variety S. gallinago is subject, especially the under surface of the wing, which presents every variety of marking, from white to the other extreme, it requires no very wide gap in the chain of the series to suppose S. Sabini to be the result of an excess of colour, in the same way as the cream-coloured varieties, which sometimes occur, may be said to be due to an absence of colour. The measurements rather exceed the corresponding ones given by Thompson, in his 'Birds of Ireland' (vol. ii. pp. 274 and 276), but the present specimen being a female, and consequently larger than the male, may account for the difference; they are as follows:—Weight 4 oz.; whole length $11\frac{6}{12}$ in.; length of wing from flexure 5 in.; stretch of wings $16\frac{8}{12}$ in.; beak, measured along the ridge, $2\frac{11}{12}$ in., along the edge of the under mandible $2\frac{8}{12}$ in.; tarsus $1\frac{5}{12}$ in.; middle toe $1\frac{3}{12}$ in., its claw $\frac{5}{24}$ in.; outer toe $1\frac{1}{24}$ in., its claw $\frac{2}{12}$ in.; inner toe $\frac{21}{24}$ in., its claw $\frac{2}{12}$ in.; hind toe $\frac{4}{12}$ in., its claw $\frac{3}{24}$ in.; tibia bare for 3 lines above the tarsal joint; toes all separate; first and second primary quills the same length; number of tail feathers 11; colour of the legs olive-green; iris dark hazel. Of the colour of the beak I regret I can say nothing, for the bird having been killed five days when I saw it, had faded apparently in this respect, as also the legs and iris, though the above colours, doubtless darker in the case of the legs than when alive, were quite distinct. The bird had not quite got over its autumn moult, which may account for the first and second wing-feathers being of the same length, and also for the number of tail-feathers, the full complement of which is fourteen, as I was able most satisfactorily to detect the loss of three. I was unable to obtain, while the skin was fresh, a fresh specimen of the common snipe, in order to compare the respective thickness of the tarsi, but, from the dry leg, if any existed, the difference must have been slight: and, lastly, in drawing a comparison between the sterna of the two, I am able to state that no specific difference, or rather no difference at all, exists; the length and breadth of the sternum, the curvature and depth of the keel, and the curvature of the furcula, all correspond exactly in each; in fact, it is impossible to distinguish them, and this is testimony in favour of the species being the same of no small value, for Mr. Alfred Newton, whose valuable collection of breast-bones exhibits specimens of several species of Scolopax, assures me that a very marked difference subsists between the sterna of every member of the genus with which he is acquainted, and made special reference to those of S. gallinago and S. Wilsonii, species which, be it remembered, were for some time confounded: he also showed me the sterna of S. major and S. gallinula, which differed materially from each other and from either of the above. Further anatomical comparison, I regret to say, is beyond me, but, should such be deemed necessary, I have preserved the body. Taking into account the rare and casual occurrence of this bird, and the fact of its never having been noticed out of the British islands, as well as our total ignorance respecting its breeding locality, the ground of colour alone seems insufficient to establish it in the rank it holds; but it is for more able hands than mine to decide its fate, whether it maintains its present position or takes its place as a highly interesting variety of the common species.—*Osbert Salvin; Trinity Hall, Cambridge, February*, 1857.

Occurrence of the Bittern in Derbyshire.—This bird is becoming a rather rare visitant in this county: one was killed on the 3rd of March last, in the parish of Melbourne, and was presented to me by the gentleman who shot it. Two young gentlemen, Thomas Briscoe and John Deans, Esqrs., were beating over some sedge which fringes an outlet of the Trent near Weston Cliff, when their dog made a stand, and, upon close inspection, it was seen that a bird was near: the bird did not seem inclined to quit his quarters, but as the dog approached him threw himself upon his back, and erected the feathers upon his neck, making a frill as starched as Queen Elizabeth's: after some little time, up rose the bird,—a bittern,—and instantly fell before the gun. It is a rare circumstance to find a bittern in Derbyshire so late in the season: when found it has usually occurred in mid-winter and in severe weather. The bird was remarkably fat: in the stomach were the bones of frogs, the remains of small fish and water-beetles, a black substance resembling peat, and a frog divided down the middle. The bird was a female, and the ovarium contained very small eggs.—*John Joseph Briggs; King's Newton, Swarkeston, Derbyshire, March* 7, 1857.

Mute Swans in Dundalk Bay.—I have to inform you that, on the 27th of February last, a flock of six swans was observed by a wild-fowl shooter in Dundalk Bay, on the north-eastern coast of Ireland, flying a long way out at sea; he saw them alight on the water, about a mile from the shore, and then, from a boat, shot one, which he brought to me, and which proved to be the mute swan (*Cygnus olor*). It was well-grown, measuring 5 feet from beak to tail, and weighing 21 lbs., but still gray on the head and parts of the back. The shooter says that all the swans in the flock had some gray plumage: they were doubtless of the same species. In Belfast Harbour and Strangford Lough small flocks of mute swans have appeared now for three successive winters, beginning with the severe weather of February and March, 1855, and many have been killed. As I have not seen any modern record of the occurrence in the British Islands of this swan in a truly wild state, although such may easily exist unknown to me, these notices may be of some interest. The bird has appeared wild on a few occasions on the north coast of France.—*Clermont; Ravensdale Park, Flurrybridge, Ireland, March* 11, 1857.

Occurrence of the Pinkfooted Goose (Anser brachyrhynchus) *in Derbyshire.*—On the evening of December 7th, 1856, a large flight of wild geese was seen slowly making its way over the river Trent, in the direction of Weston Cliff: they were journeying southwards, and seemed much fatigued. When they reached the village of Weston, several persons who had been warned of their approach stood armed with guns, and as they flew low, nearly touching the houses, they fired into the flock, and, I believe, brought down seven. One shot by Mr. Beck, of Weston, came into my hands, and proved to be an individual of the pinkfooted geese. Upon inquiry what became of the others, I was quietly told that "they had all been roasted!" I never heard of any other specimens having been taken in Derbyshire.—*John Joseph Briggs; King's Newton, Swarkeston, Derbyshire, March* 7, 1857.

Occurrence of the Longtailed Duck (Anas glacialis) *at Weymouth.*—I have lately seen a specimen of the longtailed duck; it was sent me in the flesh, on the 2nd of this month, for identification, by Mr. Weston, who shot it in the backwater of this place: it was a female, as I proved by dissection; the windpipe, as stated by Mr. Yarrell, was of the ordinary form, that is, without any enlargement at the base. The bird was very fat, and its gizzard was crammed with broken shells of the young of different species of Littorina intermina, with which I found three Rissoa labiosa, and nothing else: nothing but the shell remained, and this was broken into small pieces, and so completely had it been effected that, in many cases, the polished lining of the shell had been scaled off the remainder. A male bird was shot here some few years since by the late Mr. Wardell: these are the only well-recorded instances that have come to my knowledge. The male bird is now in the possession of Douglas Legg, of Weymouth, who is a preserver of, and dealer in, objects of Natural History.—*William Thompson; Weymouth, February* 14, 1857.

Occurrence of the Bridled or Ringed Guillemot near Penzance.—Mr. Vingoe obtained a specimen of this bird a few days since, in what is termed summer plumage, *viz.* without any portion of white on the throat or neck. The similarity of this species with the common guillemot, both as to size and general character, makes it doubtful how far the particular local markings, which give rise to its name, support its title to specific difference; however, it must be remembered that, when Nature adheres to particular marks, colours and conformations in the same parts uniformly, the characters shown by this uniformity generally aid and confirm the impression as to the specific intention of Nature. This does not always hold good to the full extent, and I may instance the ring-necked variety of the common pheasant as having the ring always in the same part of the neck, but without the deviation having the slightest claim to being specific.—*Edward Hearle Rodd; Penzance, February* 21, 1857.

Note on the British Skuas, genus Lestris.—There appears to be some obscurity about the smaller species of the British skuas, both as to the number and also as to certain characters. I remember corresponding with the late Mr. Yarrell upon this subject some years since, on receiving a very small specimen of skua in adult plumage, having the neck-feathers straw-yellow (as is the case with Richardson's and the Pomarine) and with the central tail-feathers elongated beyond the others from six to eight inches. I was induced to pronounce my bird, from the above characters, to be the true Arctic jager. I have a specimen of the L. Richardsonii also in adult plumage at least one third longer than my smaller bird, and in the same state of plumage, but the tail-feathers, which in the other were produced six or eight inches, in this do not exceed the others more than two inches. Mr. Yarrell's opinion, however, as to the identity of my two birds was at that time very decided, and he rested his conclusion upon the middle tail-feathers of both my birds being graduated in breadth from the roots and tapering to the ends, which he said was never observable in the Arctic jager, the middle tail-feathers of which are of equal breadth all along, from the roots to their tips, a character which he has delineated in its figure in his 'British Birds.' It would appear very evident, from a comparison of my two birds, from their great disparity in size, and from the difference in the characters of their tail-feathers, that they are different species; and the question is whether there is a fifth species, answering the description of the characters of Mr. Yarrell, or rather whether my smaller bird is not a distinct species from L. Richardsonii and the Arctic jager.—*Id.; Penzance, March* 11, 1857.

Birds of the Crimea. By Thomas Blakiston, Esq., Lieut. R.A.

(Continued from p. 5522).

Scansores.

On one of those clear, frozen mornings, at the close of the year, when the whole country was covered with snow, having found my way across the plain of Balaclava before sunrise, and having breakfasted at Kamara with a friend, the two of us started on our horses, with the intention of going to Phoros Pass, where the Woronzoff Road descends to the far-famed South Coast. We found the road, on account of ice, such bad going, besides my mare having thrown a shoe, that on reaching the dividing ridge between the valleys of Varnutka and Baidar, we determined on striking off through the woods for the district of Laspi. I think I shall not easily forget the view, as we then saw it: it was the Valley of Baidar, of which so much as been said, with a perfectly horizontal mist hanging over the distant part, cutting the mountains in the background, and with Petrouski's villa appearing above the trees in the foreground. By steering about south we came to the cliffs near the sea, and having fed our horses and rested for awhile we turned our heads for camp. During our ride over the wooded hills we observed a great number of missel thrushes, and, as we were going up a steep path, we caught sight of a woodpecker, on which I dismounted, and crept within ten yards of him, when I could distinctly see the bright red vent and under tail-coverts, and the back black, with white on either side of it: this, I had no doubt, was the great spotted woodpecker (*Picus major*), and afterwards Dr. Carte informed me that he obtained a specimen in March, and I saw several skins which were collected in the Crimea. We passed a little inland of Cape Aia, and, as we descended into the Valley of Varnutka, a thick fog came on, and so we had to steer across the valley by instinct, which we luckily did in a good line, and hit off the road over the hills back to Kamara. The next morning, soon after daylight, I had cleared the Sardinian camp, and was making my way across the plain for Kadakoi.

The wryneck (*Yunx torquilla*), another bird which may be here referred to, I first procured in the third week of April, and again in the beginning of the next month, up to which time I never observed two in company. Should curiosity or accident cause any one to pull this bird's tongue out of its mouth to the full extent, it may astonish him, as it did me, and on measurement I found that it extended 2¾ inches beyond the point of the bill. I have seen a young American brown bear suck molasses from the bottom of an ordinary quart wine bottle, which I thought rather wonderful: there is but little difference in the use to which the tongue of each is applied.

We now come to the little wren (*Troglodytes europæus*), so universally known in Britain; he braves the cold and snows of the Chersonese during the winter, and I observed him till near the middle of March, after which I did not notice him, but perhaps he was not absent, but probably the leaves kept him from my view.

There was also a bird, who is oftener heard than seen, and who announces summer by a note, which, in the temperate zone, where we are used only to hear croaking, chirping or whistling sounds from birds, appears singular; this bird, the common cuckoo (*Cuculus canorus*), was heard on the south coast the first week in May, and I saw a couple which a Frenchman turned out of his haversack the fourth week of September. I had not a chance of examining one minutely while in the country, but I saw a specimen which was procured in the Crimea after my arrival in England.

Tenuirostres.

I can only here enumerate one species of this tribe, the same which is the sole representative in England, the hoopoe (*Upupa epops*), of which a specimen was shot two or three days before the end of March, after which time these birds were not uncommon till near the end of August. Many specimens were brought to England by those who picked up a few birds for the cabinet.

Fissirostres.

One who has simply examined a skin or dead specimen of the roller (*Coracias garrula*) in the hand, would not form so high an opinion of his colours as another who had seen the bird on the wing; it is at that time that he is seen to advantage, the wings are expanded, exhibiting the deep blue, and altogether the colours, which appear perhaps coarse on close inspection, blend beautifully together at a distance. The person who has seen him on the wing would be apt to class him differently from the other, and possibly place him following the jays, and I am not sure that he would be badly placed, for he has a good deal of the character and appearance of the jay about him. My first meeting with this bird was early one morning in August, when I had a great hunt for a couple near our camp, which, at that time, was on the bare hills, no great distance from the sea: my gun unluckily having missed fire with both barrels, I was disappointed in obtaining a specimen at that time, as I had no idea what they were. Early in the next month, however, I shot a specimen, which was not in very good plumage, but was very fat, and I preserved it. An officer, who made a trip along the south coast, told me that he saw a good many, which must have been during the last few days of April, and I observed them in May, and by the end of the month they were numerous on the plains and river valleys between Sebastopol and the Alma.

If, as is said by former travellers, the South Coast of the Crimea is as mild as Southern Italy, may not many of the birds which leave the steppes and mountainous part of the country on the approach of winter, spend that season there, in a warmer climate than if they crossed the Black Sea to Asia Minor? A visit to that interesting district during winter would well repay the naturalist, who, I have no doubt, would clear up many points of which we are at present uncertain, and might throw some light on local migration.

Although the bee-eater is not included among the swallows, yet in habits and motions it approaches very near to some of the tribe: it may be said to be one of those connecting links in the great "chain of Nature" which a human being has not the chance to see in its perfect completeness, but can only imagine it from seeing the less links deficient the more species that are discovered. I had the long-wished-for satisfaction of riding to the Alma and back, a distance of about fifty miles, on a hot day at the end of May, and it chanced to be my last opportunity of observing several species of birds, as, not long after, I left the country; among them was the bee-eater (*Merops apiaster*), and I only wish that it was in my power to describe the graceful motions and beautiful appearance of the bird; I thought at the time that it was the nearest to perfection, in flight and plumage combined, that I had ever seen. There were numbers about the rivers Belbec, Katcha and Alma, which we crossed on the way, and at the second I observed some going in and out of holes in the high river bank, evidently their nests: they perched both on the ground and on trees. I remained watching their beautiful motions for some time; they would at times hang on the wing without an apparent motion: there were numbers about the same place, and I did not observe any pairs separate from the others. I first heard of this bird being seen in the spring, about the 4th of May, when there were numbers in the Valley of the Belbec.

The kingfisher (*Alcedo ispida*) I never observed, but Dr. William Carte procured a specimen in May, and I saw another which had also been obtained in the Crimea. These specimens do not differ materially from others killed in England.

We now pass on to a favourite tribe, the swallows, and to commence, I will take the first to arrive in the spring, after the dark season, when vegetable life may be said to be asleep. This bird, the white-bellied swift (*Cypselus alpinus*), which has in such few instances been observed in the British islands, is by no means uncommon in the Crimea, where, last year (1856), it was observed on the 2nd of April, though I did not notice it till the 6th in the Inkermann Valley, where I also saw the swallow (*Hirundo rustica*) on the 8th, which I noted "common" on the 12th, when I also observed a migration southward of the former. I fancied that I observed a pair of martins (*Hirundo urbica*), on the 4th of April, and am certain of having seen a congregation of them flying about the camp rather low on the evening of the 18th. From observation, I can say that all three species remained in numbers till the end of May. I also observed the martin and white-bellied swift in July of the year previous, and think that the latter took their departure about the end of August: they were building on the Inkermann cliffs on the 2nd of May.

The first supposed sand martin (*Hirundo riparia*) I saw on the 24th of April, among a great number of Hirundines, about a swamp at the lower part of the Tchernaya. I also observed the swift (*Cypselus apus*) at the same time, and while fishing higher up the same river, among the rocky hills, I heard a good many uttering their wild shrieks. The sand martin I have placed among the doubtful, because I only on one other occasion saw what I took for it on the wing, and never killed a specimen for comparison.

Now I have only to finish up with the latter part of the swallows' visit: they were numerous during summer, and by the middle of September had given no signs of migration, but I think that soon after the mass of them took their departure. I observed some on the 27th, but, though on the look out, none on the two following days, and I concluded that I had seen the last of them for the year: however, on the 2nd of October I saw a large assemblage hawking about in the vicinity of our camp, which I supposed were some which had bred northward.

Circumstances prevented my making any observations for a month after this. Specimens of Hirundo rustica, H. urbica and Cypselus alpinus were brought home by Dr. William Carte.

28 JY 57

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